

Drying Column Standard Laboratory Module (SLM™)

General Overview of the Drying Column SLM

The Drying Column SLM is an automated method for removing residual moisture from a liquid sample.

Environmental Protection Agency (EPA) Method

EPA organic extraction methods SW846, 3540 and 3550

Standard Analysis Method (SAM)

This SLM supports all organic SAM systems, especially those processing EPA Methods 3540 and 3550.

Advantages

This SLM automates a tedious and slow manual process. It thus reduces worker exposure to organic fumes.

General Description of the Drying Column SLM

The design is based on the manual method, which uses a long, straight column approximately 35 cm long, with a 21-mm inside diameter. Glass wool is stuffed into the column outlet to prevent sodium sulfate, which is used as the drying agent, from dropping through the column. The laboratory operator marks the 10-cm level on the column. The column is then clamped in a holding frame in the vertical position, and sodium sulfate is added to the 10-cm mark.

Once the column preparation is complete, the sample is poured into the column a little at a time to prevent overfilling. After all the sample has been put into the column, the sample flask and column are rinsed with clean solvent and allowed to drain through the column.

To automate this sequence the glass columns were redesigned. The new columns are 26 cm long and have a 11-cm lower section with a 21-mm inside diameter and a beaker on top that will hold a 500-mL sample. A flat is also built into the bottom

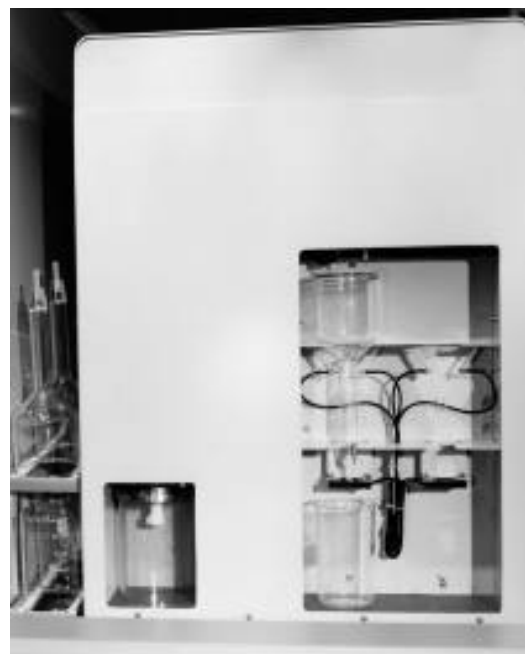


Figure 1. The Drying Column SLM.

of the column to position a 40-micron stainless steel frit. The frit replaces the glass wool plug. The Drying Column SLM is designed with two stations for the columns, a frit and powder dispenser, a solvent reservoir, and a pressure chamber. The frit and powder dispenser sit on top of a carriage, which can be positioned at either column station. The solvent reservoir holds enough solvent to perform one complete drying operation. The pressure chamber provides sample transfer from an incoming beaker filled with sample.

Control of the SLM is established via a VME Bus computer connected to a UNIX workstation with all of the operational programming resident on the workstation.

The SLM is designed for a drying capacity of 500 mL every 10 to 15 minutes, including rinses and beaker exchange. With both stations operating, this translates to eight 500-mL samples per hour. Smaller samples will increase throughput.

Status

The Drying Column SLM is currently available for licensing. Other arrangements such as Cooperative Research and Development Agreements are negotiable. The overall objective is to transfer this technology into industry, where it can be developed and marketed to meet the needs of DOE and other interests.

Industrial Partner

SciBus Analytical, Inc.

Developers

Office of Research and Technology Applications, Idaho National Engineering Laboratory.



University of Florida
University of Tennessee
University of Texas

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Los Alamos, New Mexico 87545

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